IN THE CLAIMS:

The following is a complete listing of claims in this application.

Listing of Claims:

1-48. (canceled)

49. (currently amended) A method for the production of caps having a heat shrinkable skirt comprising:

(a) extruding a thermoplastic material to form a tube having a first diameter D0, a first thickness E0, and a first cross-sectional area S0;

(b) drawing the tube in an axial direction, the axially drawn tube having a second diameter D1 less than the first diameter D0, a second thickness E1 less than the first thickness E0, and a second cross-sectional area S1, the ratio of the first cross-sectional area to the second cross-sectional area between about 2 and 10;

(c) providing a cooling assembly and cooling the drawn tube in the cooling assembly;

~~(c)~~ (d) providing a radial expansion assembly having an annular vacuum chamber and increasing the diameter of the drawn tube in the radial expansion chamber to form a radially-expanded tube having a third diameter D2 greater than the first and second diameters;

~~(d)~~ (e) passing the radially-expanded tube through an axial tension assembly;

~~(e)~~ (f) segmenting the radially-expanded tube into portions of desired length;

~~(f)~~ (g) forming a cap blank by heat shrinking one of the portion on a mandrel; and

~~(g)~~ (h) providing a head on the cap blank to form a cap having a head and a skirt.

50. (previously presented) The method according to claim 49, in which a cooling zone is provided subsequent to drawing the tube in an axial direction, the axially drawn tube at a first temperature T0, the cooling zone having a cooling assembly to lower the temperature of the axially drawn tube to a second temperature T1, the second temperature being: (a) about equal to at least the glass transition temperature Tg or the melting temperature Tf of the thermoplastic material, wherein the diameter of the axially drawn tube at the second temperature is subsequently increased or (b) low enough to interrupt the axial drawing step and to fix the diameter of the axially drawn tube at a generally predetermined diameter.

51. (previously presented) The method according to claim 50, in which the thermoplastic material is extruded at an extrusion temperature and the change in temperature from the extrusion temperature to the second temperature is between about 30° to 150°C.

52. (previously presented) The method according to claim 50, in which the thermoplastic material is extruded at an extrusion temperature and the change in temperature from the extrusion temperature to the second temperature is between about 45° to 100°C.

53. (previously presented) The method according to claim 50, in which the cooling apparatus includes an external air or water projection.

54. (previously presented) The method according to claim 50, in which the cooling apparatus comprises a ring cooled with air or water.

55. (previously presented) The method according to claim 54, in which the ring includes a part with diameter equal to about D0 so as to form a calibration ring from which a tube having a diameter of about D0 exits.

56. (previously presented) The method according to claim 50, in which the cooling means includes air or water projection provided inside the axially drawn tube.

57. (previously presented) The method according to claim 50, in which the diameter of the drawn tube is increased using a radial expansion assembly that includes a radial expansion chamber provided with an inner wall having a diameter equal to about D2 and an expansion area for increasing the diameter of the axially drawn tube from D1 to D2.

58. (previously presented) The method according to claim 57, in which the radial expansion device includes an entry ring with diameter of about D1 to provide the axially drawn tube with a diameter D1 before radial expansion of the axially drawn tube.

59. (previously presented) The method according to claim 58, in which the entry ring forms an annular chamber with an inner surface having an inner diameter D1, the inner surface comprising a plurality of orifices for providing a vacuum, the annular chamber being put under a pressure Pa less than atmospheric pressure P, wherein the axially drawn tube is pushed into contact with the inner surface.

60. (previously presented) The method according to claim 49, in which the diameter of the drawn tube is increased by (a) maintaining the inside of the drawn tube under pressure or (b) maintaining the outside of the drawn tube under negative pressure.

61. (previously presented) The method according to claim 60, in which the diameter of the drawn tube is increased by maintaining the drawn tube under a vacuum.

62. (currently amended) The method according to claim 61, in which the inner wall of the radial expansion assembly is a tubular metallic wall capable of allowing air to pass through<u>.</u>

63. (previously presented) The method according to claim 61, in which the inner wall of the radial expansion assembly is surface treated.

64. (currently amended) The method according to claim 49, in which the increase of the diameter from D1 to D2 is at least about 10 mm, <u>and</u> the increase of the diameter occurring over a distance L1 less than about 250 mm.

65. (previously presented) The method according to claim 49, further including cooling the radially-expanded tube in an auxiliary cooling assembly to a temperature T2 between 10°C. and 60°C.

66. (currently amended) The method according to claim 49, in which the thermoplastic material is extruded using a die having a diameter D0 between about 20 mm to 50 mm and thickness E0 between about 0.5 mm to 3 mm~~,~~.

67. (previously presented) The method according to claim 66, in which the thermoplastic material passes through the die at a rate of about 10 kg to 100 kg per hour.

68. (previously presented) The method according to claim 49, in which the diameter D1 of the axially drawn tube is between about 5 mm to 20 mm and the thickness E1 is between about 0.2 mm to 0.6 mm, the ratio of D1/D0 being no more than about 0.6 and the ratio of E1/E0 being no more than about 0.6.

69. (previously presented) The method according to claim 49, in which the diameter D2 of the radially-expanded tube is between about 20 mm to 50 mm and the thickness E2 is between about 0.05 mm to 0.35 mm, the ratio D2/D1 being no more than about 2 and the ratio of E2/E1 being no more than about 0.6.

70. (previously presented) The method according to claim 50, in which a radial expansion assembly is positioned at a distance L from a die for extruding the thermoplastic

material, the radial expansion assembly being generally free to move in an axial direction, the distance L selected to provide a sufficient degree of axial drawing and cooling of the axially drawn tube.

71. (previously presented) The method according to claim 70, in which the cooling assembly is positioned at a distance $L0<L$ from the die.

72. (previously presented) The method according to claim 71 in which the radial expansion assembly includes an annular chamber under a vacuum at pressure Pa, and in which a change in the pressure Pa results in displacement of the cooling assembly by a distance $\Delta L0$, wherein any increase in pressure Pa causing a decrease in the diameter D1 of the axially drawn tube being corrected by a negative displacement $\Delta L0$ sufficient to increase the diameter of the axially drawn tube to D1.

73. (previously presented) The method according to claim 71, in which the displacement $\Delta L0$ is controlled by an increase in an axial tension force Ft applied by the axial tension assembly, and in which the increase in the axial tension force Ft is corrected by a positive displacement $\Delta L0$ sufficient to reduce the diameter of the axially drawn tube to D1.

74. (previously presented) The method according to claim 49, in which the thermoplastic material comprises at least one first thermoplastic material with a glass transition temperature Tg equal to at least 40°C, the at least one first thermoplastic material selected from the group consisting of

PET, PVC, PS, PMMA, copolymers thereof, and combinations thereof.

75. (previously presented) The method according to claim 74, in which the thermoplastic material includes at least one second thermoplastic material with a glass transition temperature Tg less than 50°C, the at least one second thermoplastic material selected from the group consisting of polyolefins, ethylene copolymers, ethylene and propylene copolymers, thermoplastic elastomers, and combinations thereof.

76. (previously presented) The method according to claim 75, in which the thermoplastic material includes a mixture of the first thermoplastic material and the second thermoplastic material, the mixture including at least 50% by volume of the first thermoplastic material and between 10 to 50% by volume of the second thermoplastic material.

77. (previously presented) The method according to claim 75 in which the thermoplastic material includes a multi-layer material, the multi-layer material comprising a first layer composed of the first thermoplastic material and a second layer composed of the second thermoplastic material.

78. (previously presented) The method according to claim 77, in which the multi-layer material includes an internal adhesive layer.

79. (previously presented) The method according to claim 49, in which the thermoplastic material includes a micronized filler selected from the group consisting of talc, calcium carbonate, barium sulphate, titanium oxide, organic or mineral pigments, nanoparticle clays, and combinations thereof to color the thermoplastic material.

80. (previously presented) The method according to claim 49, in which the length of the tube portions is about the height H of the cap and in which a disc with a flat or curved edge is provided to form the head of the cap, the disc being assembled with the cap blank.

81. (previously presented) The method according to claim 80, in which the disc is obtained by cutting a sheet material of a material selected from the group consisting of plastics, metal strips or sheets, paper or cardboard, or multi-layer assemblies of these materials.

82. (previously presented) The method according to claim 81, in which the disc includes a system for identifying the cap for monitoring packaged products and providing an anti-fraud and anti-theft assembly.

83. (previously presented) The method according to claim 81, in which the disc is an excise disc.

84. (previously presented) The method according to claim 80, in which an insert comprising a head and a skirt is provided with the tube portion, the insert being placed at an

upper end of the mandrel, prior to heat shrinking of the tube portion to assemble the insert and the heat-shrunk cap blank.

85. (previously presented) The method according to claim 84, in which the insert comprises a thread and is provided with a sealing means for forming a cap.

86. (previously presented) The method according to claim 49, in which the length of the tube portion is greater than the height of the cap, the tube portion comprising a lower part for forming the skirt of the cap and an upper part for forming the head of the cap, the head being formed by compressing the upper part between a die and a head of the mandrel.

87. (previously presented) The method according to claim 86, in which the head is formed simultaneously with assembly of an auxiliary part introduced into the mold before compressing, the auxiliary part forming a pattern, an illustration or an excise means.

88. (previously presented) The method according to claim 49, in which a printing is formed on at least one of the tube portion, the skirt, the head, and the heat-shrunk cap blank.

89. (previously presented) The method according to claim 88, in which inks that can be cross-linked by radiation are used for the printing and the printing is formed at a temperature below the temperature at which the cap shrinks.

90. (previously presented) The method according to claim 88, in which the printing is formed using an ink jet printer.

91. (previously presented) The method according to claim 88, in which the printing is formed by a transfer comprising a plurality of printing nozzles in parallel along an axial direction or height H, the plurality having a nozzle density of at least 1 nozzle per mm.

92. (previously presented) The method according to claim 49, in which at least a portion of the thermoplastic material is colored through the depth of the material.

93. (previously presented) The method according to claim 78 in which the multi-layer material includes an outside layer made of a plastic material that can be printed on to provide an illustration bonded to the outside layer.

94. (previously presented) The method according to claim 49, in which the skirt includes an easy opening means.

95. (previously presented) The method according to claim 49, in which the axial tension assembly includes two driving rollers or two belt type pullers.

96. (previously presented) The method according to claim 49, in which step (a)-(e) are performed continuously.

97. (previously presented) A heat shrinkable outer closing cap obtained by the method of claim 49 for outer

closing of a previously closed bottle neck, the cap having height H between 20 mm and 100 mm and a skirt of thickness between 0.05 mm and 0.5 mm, in which the thermoplastic material includes a mix of:

(a) a first thermoplastic material with a glass transition temperature Tg of at least 40°C; and

(b) a second thermoplastic material with a glass transition temperature Tg less than 50°C.

98. (previously presented) The cap according to claim 97, in which the mix includes at least 50% by volume of the first thermoplastic material and from 10% to 50% by volume of the second thermoplastic material.

99. (currently amended) The cap according to claim ~~claims~~ 97, in which the cap includes a layer of reactivatable thermoadhesive coating on the inside to fix at least a part of the cap on the bottle neck.

100. (previously presented) A heat shrinkable closing cap obtained by the method of claim 84 for outer closing of a previously closed bottle neck, the cap having height H between 20 mm and 100 mm and a skirt thickness between 0.05 mm and 0.5 mm, a lower part of the skirt not being assembled to the insert, in which the thermoplastic material includes a mix of:

(a) a first thermoplastic material with a glass transition temperature Tg of at least 40°C; and

(b) a second thermoplastic material with a glass transition temperature Tg less than 50°C.

101. (previously presented) The cap according to claim 100, in which the mix includes at least 50% by volume of the first thermoplastic material and from 10% to 50% by volume of the second thermoplastic material.

102. (currently amended) The cap according to claim ~~claims~~ 100, in which the cap includes a layer of reactivatable thermoadhesive coating on the inside to fix at least a part of the cap on the bottle neck.

103. (previously presented) A heat shrinkable cap obtained by the method of claim 49 for outer closing of a previously closed bottle neck of sparkling wine or pressurized carbonated drink, the cap having a height H between 60 mm and 200 mm and a skirt thickness of between 0.1 mm and 1.0 mm, in which the thermoplastic material includes a mix of:

(a) a first thermoplastic material with a glass transition temperature Tg of at least 40°C, the first thermoplastic material selected from the group consisting of PET, PVC, PS, PMMA, copolymers thereof, or a mix thereof; and

(b) a second thermoplastic material with a glass transition temperature Tg less than 50°C.

104. (previously presented) The cap according to claim 103, in which the mix includes at least 50% by volume of the first thermoplastic material and from 10% to 50% by volume of the second thermoplastic material.

105. (currently amended) The cap according to claim ~~claims~~ 103, in which the cap includes a layer of reactivatable

thermoadhesive coating on the inside to fix at least a part of the cap on the bottle neck.

106. (new) The method according to claim 49, in which the annular vacuum chamber is configured to maintain a pressure less than atmospheric pressure outside the tube.